

by the outrushing surface wind characteristic of this class of storms, and stretching at right angles to the direction of advance. On stepping to the roof from the penthouse, a peculiar sound was noticed coming from the anemometer and wind-vane support. Having had experience with electrostatic machines, the sound was instantly referred to the escape of electricity from the iron points about the support. The air was calm just before the rush of surface wind, so that conditions were favorable for observing the phenomenon.

The nature and cause of the sounds were made apparent by their association with lightning discharges from dense cloud masses directly north of the station, which were at this time about 3 miles distant (distance computed by time required for report of discharge to reach station).

It was observed that the sounds ceased for a moment, and then gradually increased in intensity, and that the cessation of sound was coincident with discharge between the earth and clouds. During the short periods in which the sounds increased in intensity it was evident that the stress between the cloud and the earth was becoming greater and that the cessation of sound was owing to the relief of stress which the discharge afforded.

The same phenomenon was observed on the night of February 18, 1912, during a heavy fall of snow, when lightning was seen to the southeast of the station, but no thunder was heard. The sound on this occasion was identical with that of the recent thunderstorm, with this difference: During the snowstorm there was no variation in the intensity, nor was there any cessation of sound during the time it was observed. As the purpose of going to the roof during the snowstorm was to locate the part of the sky in which lightning occurred, the length of time the sound continued was not obtained, nor was the nature of the sound, at that time, referred definitely to electric discharge. Although darkness prevailed no illumination was observed about the iron support.

The frequency of discharge during the recent storm was not so great as to preclude the detection of time intervals. To one familiar with the sounds produced by a static machine, those about the iron support may be made intelligible by comparison with the discharge between the electrodes when they are separated by about one-sixteenth inch, and the plates are revolved moderately.

The observatory is a brick structure, with stone foundation, and soil almost wholly gravel, on the first bench on the west side of the valley of Little Goose Creek. The roof of the building is flat and covered with pitch and gravel. The walls of the building extend above the roof 3 to 5 feet, forming a parapet. The parapet is

capped with galvanized sheet iron, painted. The iron support for the wind vane and anemometer is set into the roof of the penthouse, and is braced by three iron guy rods, imbedded at the foot in the pitch and bolted to the wood boards beneath. The topmost point of the support is an arrow-shaped piece of iron, capping the shaft on which the vane turns, and is about 24 feet above the main roof.

The recent phenomenon was observed for about eight and one-half minutes, during which time five discharges of lightning from the cloud occurred, and there were as many cessations of sound from the iron support, but on account of heavy rain and hail it was necessary to leave the roof at 6.03 p. m. so that the exact time the phenomenon lasted is not known.

This phenomenon has probably been observed by others and has undoubtedly occurred on other structures having connections with moist earth, and high points favorable to electric discharge, but an account of it is believed to be of interest in furnishing evidence to confirm the modern theory of protection of buildings from lightning.

A SEVERE STORM AT CONCORDIA, KANS.

By J. W. BYRAM, Observer, United States Weather Bureau.

A severe thunderstorm swept over Concordia and its vicinity on the night of August 5-6. The first thunder was heard at 8.16 p. m., and the last at 7.34 a. m. The storm came from the northwest. The wind attained a velocity of 51 miles per hour, from the northeast, for the five minutes ending at 8.50 p. m., and during this time 1 mile was blown at the rate of 60 miles per hour.

Four buildings in the business section of Concordia were unroofed; the Presbyterian church was unroofed and otherwise damaged; the Barons House, the principal hotel, was unroofed and one of its large chimneys was blown down, causing great damage to the interior of the building. The building in which the Weather Bureau office is located was partially unroofed, and the office rooms were flooded. Large plate glass fronts in three storerooms were blown in, and a number of barns in town and in the surrounding country were destroyed. The main tent at the Chautauqua grounds was blown down and a number of persons injured slightly. The wind destroyed shade trees in all portions of the town, and orchards in the surrounding country were damaged or destroyed by wind and hail. The barn on the Nallieux farm, 5 miles southeast of Concordia, was destroyed, and a strip of country about 1 mile wide, extending south from this farm to the county line, was devastated by hail. No hail fell in Concordia.